

Kaufman - Trading Systems & Methods - Chap12

Chap12

VISIT...

LANZAROTE
Caliente.COM

12 Charting Systems

The rapid growth of computerization has had a great impact on technical trading. The first to be affected were the moving average, or mathematical trending methods, as well as easy-to-program indicators, followed by systematic optimization. More recently, econometric analysis, cycles, and pattern recognition have been the subject of new computerized research. Many quote services that offer graphics can convert a bar chart to a point-and-figure chart at the push of a button. Yet the techniques normally used in classic charting, such as trendlines, channels, and special patterns, have not yet been bombarded with automated analyses.

The systems included in this chapter are those that might be used by a traditional chartist. They do not all require the presence of a chart to be followed, but they are clearly of natural price patterns. The time that it takes for a price to move from one level to the next is not significant in many of these charting systems, it is only the level itself that is important. The only restriction is that the systems presented could all be verified and tested using a computer.

SWING TRADING

The foundation for the largest number of chart-based systems is the swing chart. Similar to point-and-figure, a swing is an upward or downward movement of a minimum size, regardless of the time it takes to achieve that move. Unlike point-and-figure, there are no boxes, and the notation does not use Xs and Os. The only difference between one swing chart and another is the swing filter. Once prices have reversed from a high or low point by the minimum amount specified by the swing filter, a new vertical line is drawn in a column to the right of the current one. An example of a swing chart is given in Figure 12.1.

Rules for using the swing chart generally follow those of point-and-figure. New buy and sell signals occur at points where the new swing penetrates the level of the prior swing in the same direction. Secondary signals are given if the new signal is in the same direction as the existing trend. Stoploss orders can be placed at trend reversal levels or at a point of fixed dollar loss.

A swing method is very different from a moving average technique because it does not require prices to move to a new level to maintain the existing trend. In a swing philosophy, prices can move sideways or stand still within a trend. Analysts will find its attributes similar to a breakout method.

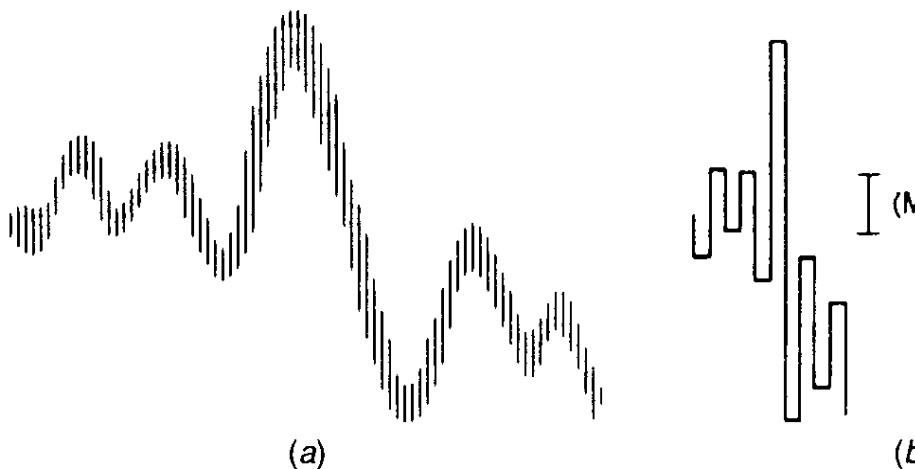
The following systems are all unique, but at the same time they are clearly simple variations of the swing method of charting.

A Classic Chartist's Swing Method

Originally, all swing charts were the product of analyzing a price chart. They observed patterns that preceded the more modern percentage retracements that now need a pocket calculator. A classic technique for finding the swing highs and lows uses the following steps' and is shown in Figure 12.2.

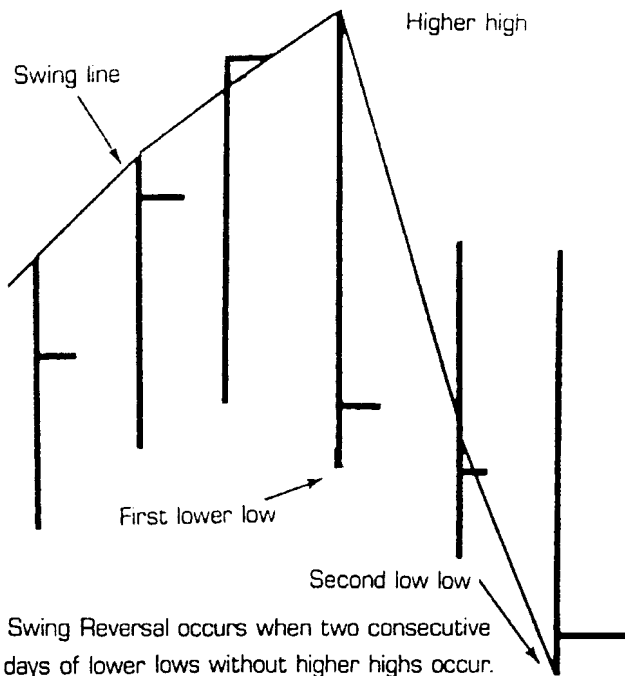
¹ Based on William F. Eng, "A Mechanical Trading System." July 1986,

FIGURE 121 Standard bar chart with corresponding swing chart. (a) Bar chart.(b) Swing chart.



1. Begin at a bar (or new day) where the highs and lows are both higher than the highs and lows of the previous bar (an upswing), or both lower than the highs and lows of the previous bar (a downswing).
2. If an upswing, connect the highs of the two periods.
3. If the next period continues to have higher highs and lows, connect the highs.
4. Continue until a bar occurs that has a lower low without making a higher high. This indicates a possible swing change based on the pattern of the next bar.
5. If the next bar has a lower high and lower low, the highest high of the swing is connected to the new lowest low and a swing change has occurred.

FIGURE 122 Constructing a classic swing chart.



Source: William Eng, "A Mechanical Trading System," *Technical Analysis of Stocks & Commodities*, 4, no. 7 (July 1986). © 1986 Technical Analysis, Inc. Used with permission.

283

6. If the swing reversal fails, the upswing continues when a new higher high and higher low occurs.

This particular method is called a "2day" (2period) technique, because it requires two periods to identify a swing change. The greatest benefit of this swing method is that it finds fast changes in market direction; however, it is recommended for its ability to identify stoploss points and control risk rather than for its entry timing.

The Livermore System

Known as the greatest trader on Wall Street, Jesse Livermore was associated with every major move in both stocks and commodities during the 30-year period from 1910 to 1940. Livermore began his career as a board boy, marking prices on the high slate boards that surrounded the New York Stock Exchange floor. During this time, he began to notice the distinct patterns, or habits, in the price movement that appeared in the columns of numbers. 2

As Livermore developed his trading skills and eventually took his position as a professional trader, he maintained the habit of writing prices in columns headed Secondary Rally, Natural Rally, Up Trend, Down Trend, Natural Reaction, and Secondary Reaction. This may have been the basis for what is now considered a swing chart.

Livermore's approach to swing trading required two filters, a larger swing filter and a penetration filter one-half the size of the swing filter.

Penetrations were significant at price levels he called "pivot points." A pivot point is defined in retrospect as the top and bottom of each new swing and are marked with letters in Figure 123.

As mentioned earlier, the swing chart differs primarily from the pointandfigure chart by having no box size. By measuring the change in trend as a reversal of the minimum swing filter size from the last high or low swing, the pivot points are always posted at the exact price at which they occurred. In pointandfigure charting, using a 10point box, a price rally that fails 5 points above the previous box will not be posted; a pointandfigure reversal is measured from the last posted box; therefore, the size of the price reversal needed to indicate a directional change may vary up to the size of one box.

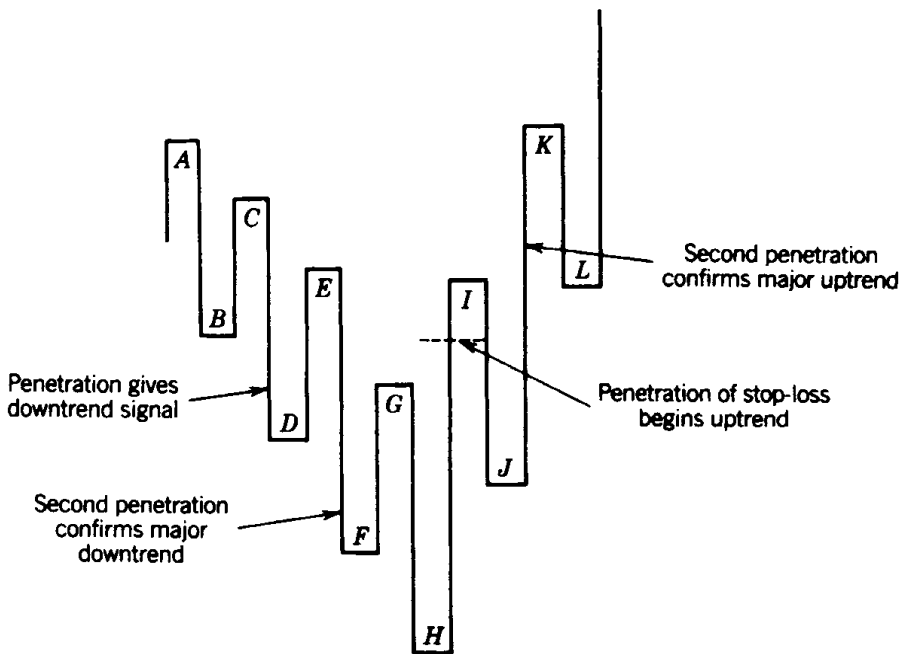
Livermore's trading technique is a unique interpretation of the swing chart. Positions are taken only in the direction of the major trend. This trend is defined by confirming higher highs and higher lows (uptrend), or lower lows and lower highs (downtrend), where the penetration filter is not broken in the reverse direction. That is, an uptrend is still intact as long as prices do not decline below the previous pivot point by as much as the penetration filter size (seen in Figure 122). Once the trend is identified, positions are added each time a new penetration occurs, confirming the trend direction. A stoploss is placed at the point of penetration beyond the prior pivot point. Unfortunately, the penetration filter is not the same as a pivot point, and Livermore never revealed how it was calculated. It seems, however, to be a minor percentage (for example, 20%) of the current swing size.

Failed Reversal

In the Livermore system, the first penetration of the stoploss calls for liquidation of the current position. A second penetration is necessary to confirm the new trend. If the second penetration fails (at point K in Figure 124), it is considered a secondary reaction within the old trend. The downtrend may be reentered at a distance of the swing filter below K, guaranteeing that point K is defined, and again on the next swing, following pivot point M,

¹ Edwin Lefevre, *Reminiscences of a Stock Operator* (Books of Wall Street, Burlington, VT, 1980). First published by George H. Doran in 1923.

² Jesse Thompson, "The Livermore System," *TecAmical Analysis of Stocks & Commodities* (May 1983).

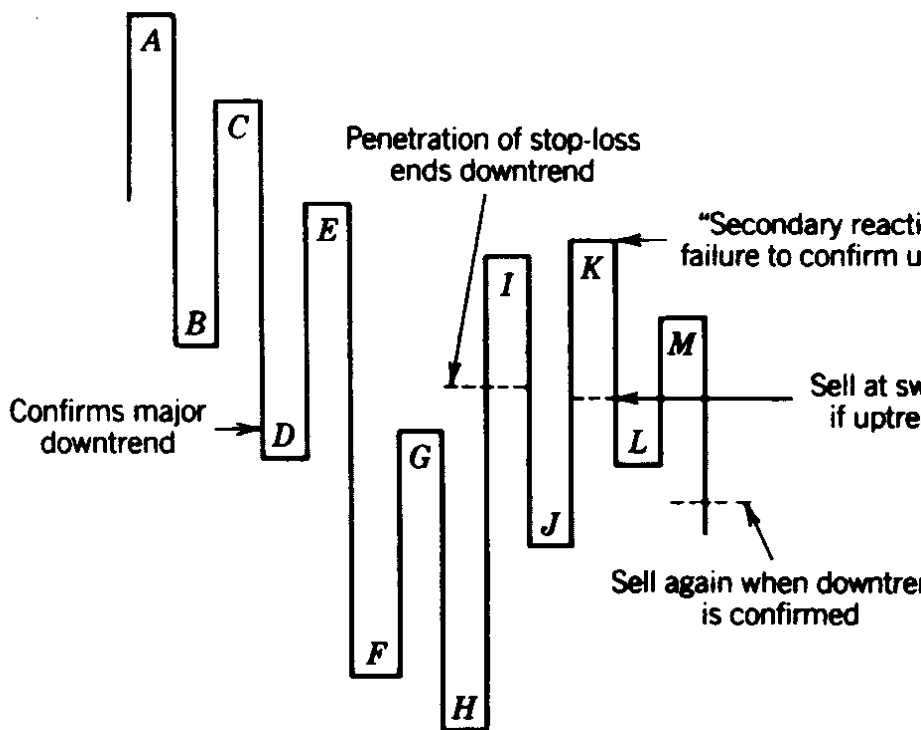


when prices reach the penetration level below pivot point L. It is easier to reenter an old trend than to establish a position in a new one.

Percentage Swings

The minimum swing value, which is the only determinate of the swing high and low points, can be more robust if it is a percentage of price rather than a fixed number of points or fixed dollar value. Many markets have doubled in value over the past 10 years in stocks the price of a technology issue could have increased 20 times and then split. A fixed value for finding the swing highs and lows will be far apart at low price levels and too frequent at higher prices, unless that minimum is calculated as a percentage, p.

FIGURE 124 Failed reversal.



285

Minimum swing value $MSV_i = p \times$

The most basic systematic approach to trading a swing method is simply to buy when prices move up from the recent lows by the minimum swing value (MSV), and sell when prices fall by the MW from the recent high. The risk of each trade is always equal to the current value of MW

Finding the Swing High and Low Points

The following Easy Language program, KSWING, plots the swing high and low based on a percentage minimum swing value. For percentage swings, the interest rate yield should be used rather than price.

{KSWING: Finds most recent swing highs and lows.

Plots values on a TradeStation chart. Copyright 1994-95, P.J. Kaufman.
reserved.

Inputs for KSWING:

swing = price swing in %}

input: swing(2.5);

vars: pcswing(0), last(0), curhigh(0), curlow(0), swhigh(0), swlow(0),
highbar(0), lowbar(0), chighbar(0), clowbar(0), lowp(0), highp(0),
xclose(0), xhigh(0), xlow(0), divide(4);

pcswing = swing / 100.;

{ "divide" positions the high or low market on the plot }

divide = 4;

factor = 1;

{ INITIALIZE MOST RECENT HIGH AND LOW }

if currentbar = 1 then begin

curhigh = close; {current high}

curlow = close; {current low}

end;

{ SEARCH FOR A NEW HIGH -- favor reversals }

if last <> 1 then begin

{ REVERSE FROM HIGH IF MINIMUM % SWING }

if low < curhigh - curhigh*pcswing then begin

last = 1; {last high fixed}

swhigh = curhigh; {new verified high}

highbar = chighbar;

curlow = low; {initialize new lows}

lowp = low; {swing low for plot}

clowbar = currentbar;

plot1[currentbar-highbar](high[currentbar-highbar]' + highp*pcswing/d
"swinghigh");

end

else begin

if high > curhigh then begin

curhigh = high; {new current high}

chighbar = currentbar;

end;

end;

end;

{ SEARCH FOR A NEW LOW - favor reversal }

if last <> -1 then begin

{ REVERSAL FROM LOW IF MINIMUM % SWING }

if high > curlow + curlow*pcswing then begin

last = -1;

```

    swlow  = curlow;
    lowbar  = clowbar;
    curhigh = high;      {initialize curr
    highp   = high;      {swing high for
    chighbar = currentbar;
    plot2[currentbar-lowbar](low[currentb
    "swinglow");
    end
else begin
    if low < curlow then begin
        curlow = low;
        clowbar = currentbar;
        end;
    end;
end;

```

Wilder's Swing Index

An automated way of determining swings is presented with trading rules in Wilder's Swing Index System.' Wilder has determined that the five most important positive patterns in an uptrend are:

1. Today's close is higher than the prior close.
2. Today's close is higher than today's open.
3. Today's high is greater than the prior close.
4. Today's low is greater than the prior close.
5. The prior close was above the prior open.

in a downtrend, these patterns are reversed.

The Swing Index M combines these five factors, then scales the resulting value to fall between 100 and +100 as follows:

$$SI = 50 \left(\frac{(C_t - C_{t-1}) + .5(C_t - O_t) + .25(C_{t-1} - O_{t-1})}{R} \right) \frac{K}{M}$$

where K is the largest of $H_t - C_{t-1}$ and $L_t - C_{t-1}$

M is the value of a limit move

R is calculated from the following two steps:

1. Determine which is the largest of

a. $H_t - C_{t-1}$

b. $L_t - C_{t-1}$

c. $H_t - L_t$

2. Calculate R according to the corresponding formula:

a. $R = (H_t - C_{t-1}) - .5(L_t - C_{t-1}) + .25(C_{t-1} - O_{t-1})$

b. $R = (L_t - C_{t-1}) - .5(H_t - C_{t-1}) + .25(C_{t-1} - O_{t-1})$

c. $R = (H_t - L_t) + .25(C_{t-1} - O_{t-1})$

Although the usefulness of the SI cannot be determined without proper testing, the formulas combine factors that have a great deal of interest. The SI calculation uses three

4 J. Welles Wilder, Jr., *New Concepts in Technical Trading System* (Trend Research, Greensboro, NC, 1978).

287

price relationships, the net price direction (closetoclose), the strength of today's trading (opentoclose), and the memory of yesterday's strength (prior opentoclose). It then employs the additional factor of volatility as a percentage of the maximum possible move (KIM). The rest of the formula simply scales the results to within the required 100 to +100 range. in the first step of the calculation of R , the concept of the true range reappears.

The daily values are added together to form an Accumulated Swing Index (ASI), which substitutes for the price chart, allowing ready identification of the significant highs and lows, as well as clear application of Wilder's trading rules.

Terms used in the trading rules are as follows:

HSP High swing pointAny day on which the ASI is higher than both the previous and the following day.

LSP Low swingpointAny day on which the ASI is lower than both the previous and the following day.

SAR Stopandreverse points (three types)Index SAR points are generated by the ASI calculation, SAR points apply to a specific price, and Trailing Index SAR, which lags 60 ASI

points behind the best ASI value during a trade.

The Swing Index System rules are:

1. Initial entry:

- a. Enter a new long position when the ASI crosses above the previous HSP
- b. Enter a new short position when the ASI crosses below the previous LSP

2. Setting the SAR point:

- a. On entering a new long trade, the SAR is the most recent LSP. the SAR is reset to the first LSP following each new HSP A trailing SAR is determined as the lowest daily low occurring between the highest HSP and the close of the day on which the ASI dropped 60 points or more.
- b. On entering a new short trade, the SAR is the most recent HSP; the SAR is reset to the first HSP following each new LSP The trailing SAR is determined as the highest daily high occurring between the lowest LSP and the close of the day on which the ASI rose by 60 points or more.

Keltner's MinorTrend Rule

One of the classic trading systems is the Minor Trend Rule published by Keltner in his book *How to Make Money in Commodities* (The Keltner Statistical Service). It is still followed closely by a great part of the agricultural community and should be understood for its simplicity and potential impact on markets. Sophisticated analysts must always remember that a large part of trading activity is the result of straightforward decisions that do not use high technology.

Keltner defines an upward trend by the failure to make new lows (comparing today's low with the prior day) and a downtrend by the absence of new highs. This notion is consistent with chart interpretation of trendlines by measuring upward moves along the bottom and downward moves along the tops. The Minor Trend Rule is a plan for using the daily trend as a trading guide. The rule states that the minor trend turns up when the daily trend sells above its most recent high; the minor trend stays up until the daily trend sells below its most recent low, when it is considered to have turned down. To trade using the Minor Trend Rule, buy when the minor trend turns up and sell when the minor trend turns down; always reverse the position.

The Minor Trend Rule is a simple, shortterm trading tool, buying on new highs and selling on new lows. It is a breakout method in the style of swing trading and can be used

288

as a leading indicator of the major trend. It requires frequent trading in most markets, with risk varying according to the volatility of the market. Keltner's Minor Trend Rule is the basis for a number of current technical systems that vary the time period over which prior highs and lows are established and consequently increase the interval between trades and the risk of each trade. An advantage of the Keltner approach is that it imposes no arbitrary restrictions on the analysis of prices (e.g., breakouts of 100 points).

Donchian's FourWeek Rule

In the mid 1970s, Playboy's Investment Guide reviewed Donchian's FourWeek Rule as "childishly simple ... was recently discovered to rank premiere among a dozen widely followed mechanical techniques." And the rules are simple:

1. Go long (and cover shorts) when the current price exceeds the highs of the previous 4 full calendar weeks.
2. Go short (and liquidate longs) when the current price fails below the lows of the previous 4 full calendar weeks.
3. Roll forward if necessary into the next contract on the last day of the month preceding expiration.

In 1970, The Traders Note Book (Dunn and Hargitt Financial Services), rated the FourWeek Rule as the best of the popular systems of the day. Based on 16 years of history, the best performers were December wheat, June cattle, May copper, August bellies, January soybean oil, and May potatoes.

The system satisfies the basic concepts of trading with the trend, limiting losses and following welldefined rules. It bears a great resemblance to the principle of Keltner's Minor Trend Rule, modified to avoid trading too often. Over the years this technique, classified as a slow breakout system, has shown the greatest longevity. The system is so simple that the only comments about it must also be simple: can a FourWeek Rule work for all markets? If price volatility increases dramatically, the high and low for a 4week period could become astronomical, while at the same time lower prices could cause narrow ranges in another market. That characteristic is both a key to its success and a problem for risk control. The solution may be a price levelmodified rule (called adaptive) that reduces the number of weeks (or days) in the highlow measured period as prices and volatility increase. A change of this sort would keep risk on a more even level but still relate to the basic volatility principle of the original system. This approach is discussed in Chapter 17 ("Adaptive Techniques").

Modified for the Final Three Months

One system based on the FourWeek Rule uses only the last 3 months of each futures contract. Beginning 3 months before the delivery month, plot the highs and lows according to the FourWeek Rule. For example, trading December silver, start on September 1 and plot for 4 weeks. The first time the market price crosses the high or low of that 4week period, take the appropriate long or short position and place a stoploss of 2 1/2.% of the entry price. If not stopped out, liquidate the position on the last day of the month prior to delivery. If stopped out, reenter a new position using the high and low established during the original 4 weeks.

The theory behind the modification is that breakouts are more valid and larger in the period just prior to delivery. An advantage of the system is that it trades very little and has a low commission burden. The disadvantage is that the stoploss counteracts the nature of the breakout system and imposes an artificial risk level on a method that uses highs and lows established by the market itself. This feature is likely to harm the robustness of the concept.

The NDay Rule

Computers have allowed us to take many simple ideas and examine them in great detail, sometimes to excess. One of the earliest applications of computer power was to change the FourWeek Rule into the NDay Rule, the predecessor of the nminute and ntick rules. The rationale seems logical. If the FourWeek Rule works but the equity drawdown is too large, shortening the time period should improve results.

The NDay Rule states that a buy signal occurs when the current price exceeds the highest price of the past N days; a sell signal occurs when the current price fails below the lowest price of the past N days. The determination of N is critical to the success of this system. The most obvious approach to finding N is by testing a broad range of values (as will be shown in the next section). It has also been suggested that N could be variable based on the relationship of normal volatility to current volatility.'

$$N_t = N_I \times \frac{V_t}{V_c}$$

where N_t is the number of days used for today's calculation

N_I is the initial number of days used for normal m

V_n is the normal volatility measured over historical

V_c is the current volatility measured over a fixed p
volatility, V_n

As the current volatility increases, the number of days used in today's calculation decreases. This may also be classified as an adaptive technique.

Testing the NDay Rule

Weekly breakouts, a limited case of the NDay Rule, were tested by Hochheimer and summarized in his report as the Weekly Price Channel. Weekly breakouts produce a slow trading system that depend on major moves for profits. About 75% of those futures markets tested in this 1982 study' showed higher risk (some very high), than the crossover systems tested earlier (also see Chapter 2 1).

The original purpose for the Weekly Rule was to look at prices only on Friday. The close on Friday is considered in the same sense as the daily close more important because it is the evening up at the end of the day. Traders are attributed with the feeling that holding a position over a weekend is the only thing worse than holding it overnight. This evening up will prevent false signals that may never occur midday or midweek.

Typical trading rules for a Weekly Price Channel system would be

1. Buy (and close out shorts) if the closing price on Friday exceeds the highest closing price of the past N weeks.
2. Sell (and close out longs) if the close on Friday is below the lowest

closing price of the past N weeks.

Because this model is always in the market, it is possible for the risk to become very high. The commitment to a new long position is the difference between the highest and lowest closing prices of the past N weeks. In addition, even if penetrated, the position is not liquidated until the close of Friday. This could be a very risky proposition; however, that risk is offset by the smoothing effect of only acting once each week. It may be that higher risk is better than being subjected to more frequent false signals.

Andrew D. Seidel and Philip M. Ginsberg, *Commodities Trading* (PrenticeHall, Englewood Cliffs, NJ, 1983).

Frank L. Hochheimer and Richard J. Vaughn, *Computerised Trading Techniques* 1982 (Merrill Lynch Commodities, New York, 1982).

290

Alternate rules were tested by Hochheimer in his study. Buy and sell signals were taken at the time that the intraday new high or new low occurred. No comparison was available to determine whether the risk was greater or less than the conventional approach. Hochheimer also tested the Weekly Rule with the week ending on days other than Friday. It was not apparent that any one day was better.

Traders will find this basic breakout method is important as a benchmark study. Chapter 5 ("Trend Systems") included the NDay Breakout as one of the basic trending methods in "Comparison of Major Trend Systems, and shows 10 years of results for the Eurodollar. included with the study is program code to help enter this program into a computer to allow further testing.

Avoiding Problems Programming the Weekly Breakout

The Weekly Rule is often thought of having signals only on Friday; however, when programming this method, it is important to remember that a number of weeks end on Thursdays due to holidays. Identifying the last day of the week in advance is a problem for a computer program. Although we can find the day of the week by simply using the function @D a y 0 f W e e k for Easy Language, or @W K D A Y in Quattro, we have missed the day if the information returned jumps from Thursday to Monday.

The simpler and preferred method, using most intelligent market charting systems, is to request weekly data, or a weekly chart, rather than daily. The builtin conversion program will correctly change days to weeks. By looking at the high, low, and close of the weekly bar you can decide whether a signal has occurred, and executing on the close will be the last price of the week, regardless of the day on which it occurs.

WILLIAM DUNNIGAN AND THE THRUST METHOD

Dunnigan's work in the early 1950s is based on chart formations and is purely technical. Although an admirer of others' abilities to perform fundamental analysis, his practical approach is contained in the statements: "If the economists are interested in the price of beans, they should, first of all,

learn all they can about the price of beans. " Then, by supporting their observations

with the fundamental elements of supply and demand, they will be "certain

that
the bean prices will reflect these things. '"

Dunnigan did extensive research before his major publications in 1954. A follower of the Dow theory, he originally created a breakaway system of trading stocks and commodities, but was forced to drop this approach because of long strings of losses even though the net results of his system were profitable. He was also disappointed when his 2 3/8 Swing Method failed after its publication in *A Study in Wheat Trading*. But good often comes from failure and Dunnigan had realized by now that different measurements should be applied to each market at different price levels. His next system, the Percentage Wheat Method, combined a 2 1/2% penetration and a 3day swing, introducing the time element into his work and perhaps the first notion of thrust, a substantial move within a predefined time interval. With the 2 1/2%, 3day swing, a buy signal was generated if the price of wheat came within 2% of the lows, then reversed and moved up at least an additional 2 1/2% over a period of at least 3 days.

For Dunnigan, the swing method of charting' represented a breakthrough; it allowed each market to develop its natural pattern of moves, more or less volatile than any other

' William Dunnigan, *Selected Studies in Speculation* (Dunnigan, San Francisco, 1954, p. 7).

'WD. Gann, *How to Make Profits in Commodities* (LambertGann, Pomeroy, WA, 1976). This book devotes a large section to swing charts and includes many examples of markets prior to Dunnigan's work.

291

market. He had a difficult time trying to find one criteria for his charts that satisfied all markets, or even all grains, but established a \$2 swing for stocks where Rhea's Dow Theory used only \$1 moves. His studies of percentage swings were of no help.

The Thrust Method

Dunnigan's final development of the Thrust Method combined both the use of percentage measurements with the interpretation of chart patterns, later modified with some mathematical price objectives. He defines a downswing as a decline in which the current day's high and low are both lower than the corresponding high and low of the highest day of the prior upswing. If currently in an upswing, a higher high or higher low will continue the same move. The reverse effect of having both a higher high and low would result in a change from a downswing to an upswing. The top and bottom of a swing are the highest high of an upswing and the lowest low of a downswing, respectively. It should be noted that a broadening or consolidation day, in which the highs and lows are both greater or both contained within any previous day of the same swing, has no effect on the direction.

In addition to the swings, Dunnigan defines the five key buy patterns:

1. Test of the bottom where prices come within a predetermined percentage of a prior low
2. Closing price reversal a new low for the swing followed by a higher close than the prior day
3. Narrow range where the current day's range is less than half of the largest

range for the swing

4. Inside rangewhere both the high and low fall within the prior range
5. Penetration of the toppy any amount, conforming to the standard Dow theory buy signal

All of these conditions can be reversed for the sell patterns. An entry buy signal was generated by combining the patterns indicating a preliminary buy, with a thrust the next day confirming the move. The thrust was defined as a variable price gain based on the price level of the market (for 1954 wheat, this was from 1/2 to 1 1/2c Dunnigan's system attempted to enter the market long near a bottom and short near a top, an improvement on the Dow theory. Because of the risks, the market was asked to give evidence of a change of direction by satisfying two of the first four patterns followed by a thrust on the next day. Any variance would not satisfy the conditions and an entry near the top or bottom would be passed.

The same buy and sell signals applied to changes in direction that did not occur at prior tops and bottoms but somewhere within the previous trading range. In the event all the conditions were not satisfied and prices penetrated either the top or bottom, moving into a new price area, the fifth pattern satisfied the preliminary signal and a thrust could occur on any day. This was not restricted to the day following the penetration. So that if nothing else happened, Dunnigan followed the rules of the Dow Theory to insure that a major move would not be missed.

It has been said by followers of Dunnigan's method that his repeat signals are the strongest part of his system. even Dunnigan states that they are more reliable although they limit the size of the profit by not taking full advantage of the trend from its start. Repeat signals use relaxed rules not requiring a new thrust because the trend has been identified. Two key situations for repeat buy signals are:

1. A test of the bottom followed by an inside range (interpreted as market indecision)
2. A closing price reversal followed by an inside range

292

A double thrust occurs when the first thrust is followed immediately by a second thrust; or, after the first thrust, a congestion area develops, followed by a second thrust in the same direction as the first. Although Dunnigan used a fixed number of points to define his thrust, today's traders may find the standard deviation of the daily price changes or another volatility measure as a more practical basis for identifying significant price moves.

OneWay Formula

Dunnigan worked on what he hoped would be a generalized version of his successful Thrust Method and called it the OneWay Formula. Based on his conclusions that the Thrust Method was too sensitive, causing more false signals than he was prepared to accept, he modified the confirmation aspect of the signal and made the thrust into the preliminary signal. He also emphasized longer price trends which smooth performance and reduce signals.

With the upswing and downswing rules remaining the same,

Dunnigan modified the thrust to require its entire range to be outside the range of the prior day. For a preliminary buy, the low of the day must be above the high of the prior day. This is a stronger condition than his original thrust, yet only constitutes a preliminary buy. The confirmation occurs only if an additional upthrust occurs after the formation of, or test of a previous bottom. There must be a double bottom or ascending bottom followed by a thrust to get a buy signal near the lows. If the confirmation does not occur after the first bottom of an adjustment, it may still be valid on subsequent tests of the bottom.

For the OneWay Formula, repeat signals are identical to original confirming signals. Each one occurs on a pullback and test of a previous bottom, or ascending bottom, followed by an upthrust. Both the initial and repeat signals allow the trader to enter after a reaction to the main trend. The Dow approach to penetration is still allowable in the event all else fails. The refinement of the original thrust method satisfied Dunnigan's problem of getting in too soon.

The SquareRoot Theory

The two previous methods show a conspicuous concentration of entry techniques and an absence of ways to exit. Although it is valid to reverse positions when an opposite entry condition appears, Dunnigan spends a great effort in portfolio management' and riskreward conditions that were linked to exits. By his own definition, his technique would be considered trap forecasting, taking a quick or calculated profit rather than letting the trend run its course (the latter was called continuous forecasting).

A fascinating calculation of risk evaluation and profit objectives is the SquareRoot Theory. He strongly supported this method, thinking of it as the golden` key, and claiming support of numerous esoteric sources such as The Journal of the American Statistical Association, The Analysts journal, and Econometrica. The theory claims that prices move in a square root relationship. For example, a market trading at 81 (or 9') would move to 64 (8') or 100 (10')~ either would be one unit up or down based on the square root. The rule also states that a price may move to a level that is a multiple of its square root. A similar concept can be found greatly expanded in the works of Gann (Chapter 14).

NOFRI'S CONGESTIONPHASE SYSTEM

Markets spend the greater part of their time in nontrending motions, moving up and down within a range determined by nearstable equilibrium of supply and demand. Most trend

Each of his writings on systems contained examples of multiplefund management of Varied risk.

Refers to the Greek description of Fibonacci ratios .

followers complain about the poor performance that results from markets that fail to move continuously in one direction. However, their systems are designed to conserve capital by taking repeated small losses during these periods to capture the big move. Eugene Nofri's system, presented by Jeanette Nofri Steinberg, is used during the long period of congestion, returning steady but small profits. Nofri's system does not concern itself

with the sustained directional move; therefore, the user of the CongestionPhase System can wait to be certain of a welldefined congestion area before beginning a trading sequence.

The basis of the system is a 3rdday reversal. If prices are within a congestion range and have closed in the same direction for 2 consecutive days, take the opposite position on the close of day 2, anticipating a reversal. If this is correct, take the profits on the close of trading the next (3rd) day. Nofri claims a 75% probability of success using this technique, and the Theory of Runs supports that figure. if there is a 50% chance of a move either up or down on day 1, there is a 25% chance of the same move on the next day, and 12 1/2% chance on day 3. Considering both commissions and variation in the distribution, an assumption of 75% is reasonable.

Because the basis of the CongestionPhase System is an unlikely run within a sideways price period, the substitution of a 4day run instead of the current 3day run should increase the profitability and reliability of the individual trades while reducing the number of opportunities.

The CongestionPhase System is only applied to markets within a trading range specifically defined by Nofri. Users are cautioned not to be too anxious to trade in a newly formed range until adequate time has elapsed or a test of the support and resistance has failed. The top of the congestion area is defined as a high, which is immediately followed by 2 consecutive days of lower closing prices. the bottom of the congestion area is a low price followed by 2 higher days. A new high or low price cancels the congestion area. Any 2 consecutive days with prices closing almost unchanged (for example, J 2 ticks) are considered as 1 day for the purposes of the system. These ranges occur frequently and can be found by charting prices using the last 10 days. In cases in which the top or bottom has been formed following a major breakout or price run, a waiting period of 10 additional days is suggested to ensure the continuance of the congestion area and limit the risk during more volatile periods. Remember, systems that trade only within ranges offer many opportunities that should be exercised with patience.

A congestion area is not formed until both a top and bottom can be identified. Penetration of a previous top and formation of a new top redefines the range without altering the bottom point; the opposite case can occur for new bottoms. if a false breakout occurs lasting 2 or 3 days, safety suggests a waiting period of 7 days. Logical stops are also possible, the most obvious places being the top and bottom of the current congestion area. but closer stops could be formulated based on price volatility.

The CongestionPhase System can stand alone as a shortterm trading method or can be used to complement any longer technique. When trying to improve entry or exit fills, the system qualifies as a timing device but only within the congestion areas defined by the rules. It is not intended to be used in all situations. The converse of the system says that an entry signal given outside of a congestion area should be taken immediately because longer periods of prolonged movement in one direction are most likely. But in a trading range, the CongestionPhase System may turn a

moving average technique from a loser to a winner.

OUTSIDE DAYS WITH AN OUTSIDE CLOSE

There are numerous chart patterns that can be profitable if they are properly identified and traded consistently. Unfortunately, any one pattern may not appear very often and traders

294

may become impatient waiting for the opportunities. For others who may feel that overall trading success is a combination of small victories, the outside day with an outside close is one such successful pattern.

An outside day has the high and low outside the range of the previous day; that is, the high is higher and the low is lower. An outside close is one in which the closing price is higher or lower than the prior day's high or low, respectively. This is considered an attempt to move in one direction followed by a strong push in the other direction. If the close was in the direction opposite to a recent price move, this is called a key reversal day;" however, because the previous price direction is not distinguished, it is not necessarily a reversal but may be a renewal of the trend direction.

A brief study by Arnold` showed that this pattern proved profitable for a small sample of currencies, metals, and financials using the following rules:

1. Buy on the close of an outside day if the close is above the prior high; sell if the close is below the prior low.
2. If buying, place a stoploss just below the low of the outside day; if selling, place the stop just above the high.
3. Close out the position on the close 3 days after entry.

After studying exits on days 1 through 5 following the trade entry, Arnold concluded that this formation predicts reasonably consistent price movements for the next 3 days.

ACTION AND REACTION

The human element in the market is not responsible for the ultimate rise and fall of prices, but for the way in which prices find their proper level. Each move is a series of overreactions and adjustments. Many stock and commodity analysts have studied this phenomenon and base entire systems and trading rules on their observations. Elliott's Wave Principle is the clearest and most wellknown of the theories founded entirely on this notion. Tubbs' Stock Market Correspondence Course is the first to define the magnitude of these reactions in the Law of Proportion; and, in 1975 the Trident System was based on both the patterns and the size of the action and reaction.

Retracement of a major bull campaign is the most familiar of the market reactions and the one to which almost every theory applies. It is virtually unanimous that a 100% retracement, back to the beginning of the move, encounters the most important support level. The 100% figure itself has been discussed in terms of unity, referring to its behavioral significance. The next most accepted retracement level is 50%, strongly supported by Gann and commonly discussed by experienced speculators. The other significant levels vary according to different theories:

Schabacker accepts an adjustment of Y_i or $1/2$, considering anything larger to be a trend reversal.

Angas anticipates 25% reactions for intermediate trends.

Dunnigan and Tubbs look at the larger $1/2$, $2/3$, or $1/4$ adjustment.

Gann takes inverse powers of 2 as behaviorally significant: $\sqrt{2}$, $1/4$, $1/8$, . . .

Elliott bases his projections on the Fibonacci ratio and its complement (.618 and .382).

Predicting advances into new ground is also based on prior moves.

Gann believed in multiples of the lowest historic price as well as even numbers; prices would find natural resistance at \$2, \$3, . . . , at intermediate levels of \$2.50, \$3.50, . . . , or at two to three times the base price level.

Elliott looked at moves of 1.618% based on a Fibonacci ratio.

See the discussion of key reversals in Chapter 8.

Curtis Arnold, *Your Computer Can Take You Beyond Charting*, "Futures (May 1984).

295

Fibonacci Ratios

Along with the most common 1 , $1/2$, $1/3$, and $1/4$, retracement values, Fibonacci ratios are considered of equal importance. Fibonacci ratios are found by dividing one number in the Fibonacci summation series $1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 14 \dots$

by the preceding or following value. The series is formed beginning with the values $1, 1$, and adding the last two numbers in the series together to get the next value. The numbers in the series, especially those up to the value 21 , are often found in nature's symmetry; however, the most important aspect of the Fibonacci sequence is the ratio of one value to the next. Called the Golden Ratio, this value FN/FN , approaches 1.618 as N gets large. Oddly, the inverse $FN, 1/FN = 0.618$, which is a feature that has drawn attention.

The Golden Ratio has a long history. The great pyramid of Giza, the Mexican pyramids, many Greek structures, and works of art have been constructed in the proportions of the Golden Ratio. These and some further examples are given in Chapter 14 where they are also shown in context with trading systems. At this time it is important to recognize that many analysts who consider human behavior as the primary reason for the size of a price move and their retracements, use the Fibonacci ratio .618 or its reciprocal $1/.618 = 382$, as very likely targets. Elliott is the most wellknown advocate, and applications of his Wave Theory are filled with these ratios.

Retracement rules have not been proved scientifically, but they are accepted by most traders. In general terms, the retracement theories, or revelation methods, can be categorized as either proportional retracements or timedistance goals. Proportional retracement states that prices will return to a level that is clearly related, by proportion or ratio, to the length of the prior price move. The larger the move, the clearer the retracement. The percentages and ratios expected to be successful are those that are most obvious: 100%, 50%, 33%, and so on, in addition to the Fibonacci ratio 1.618 and its inverse 0.618 . The timedistance rule is popularized in the

works of Gann (also found in Chapter 14). Gann's retracement objectives can best be thought of as forming an arc of a circle, with the center at the price peak. The goal is satisfied when prices touch any point on the circle.

Tubbs' Law of Proportion

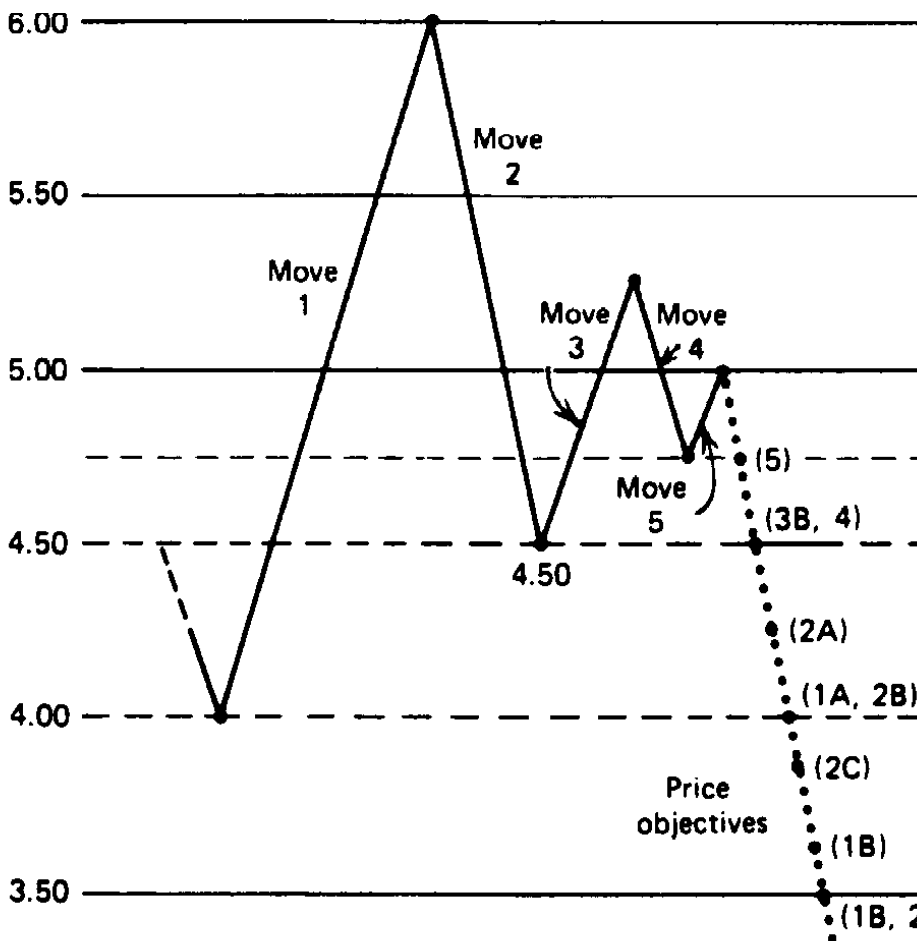
The technical part of Tubbs course in stock market trading is intense chart interpretation. The Law of Proportion presented in Lesson 9 is a welldefined actionandreaction law. In cases where the nearby highs or lows of a swing were not broken, Tubbs claims four out of five successful predictions with his principle. The law states:

Aggregates and individual stocks tend to run on half twothirds, threefourths of

previous moves. First in relation to the next preceding move which was made.

Then in relation to the move preceding that.

Applied to silver, an initial move from \$4 to \$6 would react $1/2$ to \$5, $2/3$ to \$4.67, or $1/4$ to \$4.50. Tubbs does allow for traditional price support as a major obstacle to the measured price retracement, and so unity (a 100% retracement) may be added to the three proportions. Figure 125 shows subsequent reactions to the silver move just described; the second reversal could be any of three magnitudes (or back to major support at \$4.00), ending at \$4.50, a $3/4$ reversal. Reversals 3, 4, and 5 are shown with their possible objectives. The last reversal, 5, becomes so small that the major support levels (horizontal broken lines) are considered as having primary significance, along with proportions of moves 1 and 2. Major support at \$4.00 coincides with $\%$ of move 1 and $\%$ of move 2. This would normally be sufficient to nominate that point as the most likely to succeed. Tubbs indicates that



these points rarely occur with exactness, but proportions serve as a valuable guideline. The principle is one of reaction in relationship to an obvious preceding action.

Trident

The Trident Commodity Trading System received its fair share of publicity when it was introduced at the beginning of 1975. An article in the 1977 Dow Jones Commodities Handbook had an excellent review of the background of the system and some of the conflicts surrounding its presentation and subsequent successes and failures. The system itself is not unique in concept but in its implementation. It is based upon the principle of price action and reaction with formations similar to the waves of R.N. Elliott. For each price move, there is a point of undervalue and overvalue with subsequent reaction, or adjustments, in price as it moves irregularly in the direction determined by the ultimate balance of supply and demand.

The object of the system is to trade in the direction of the main

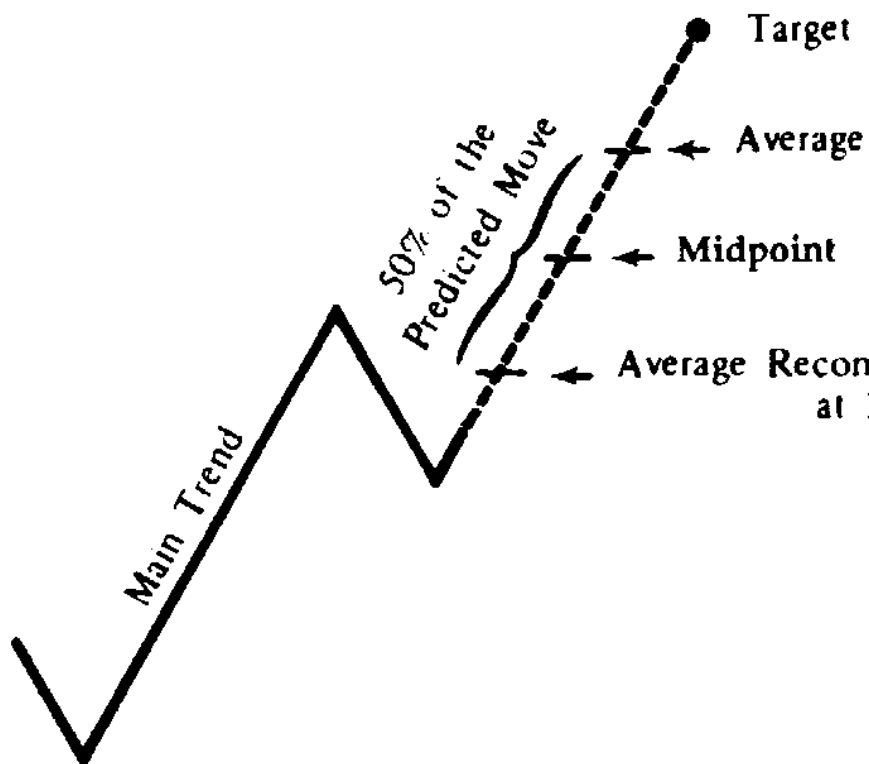
trend but take advantage of the reaction (or waves) to get favorable entry and exit points. The concept of trading with the trend and entering on reactions is discussed in the context of commodity technical analysis as early as 1942 by WD. Gann and in the preceding section on action and reaction. The goal is to predict where the reactions will occur and what profit objective to set for each trade.¹ Trident's approach is easy to understand: Each wave in the direction of the main trend will be equal in length to the previous wave in the same direction. The target is calculated by adding this distance to the highest or lowest point of the completed reaction. As with Elliott's principle, the determination of the tops and bottoms of the waves is dependent on the time element used; the complex form of primary and intermediate waves would hold true with Trident (Figure 126).

Because there are inaccuracies in the measurement of behavioral phenomena, Trident emphasizes the practical side of its theory by offering latitude in its choice of entry and exit

¹ Gann's work also discusses this topic specifically.

297

FIGURE 126 Trident entryexit .



points. By entering after 25% of the anticipated move has occurred and exiting 25% before the target, there is ample time to determine that the

downward reaction has ended before your long position is taken and enough caution to exit well before the next reaction. A critical point in each main trend is midway between the start of the move and the target. If the midpoint is not reached, there is a change in direction of the main trend causing a reevaluation of the main trend and the reactions. A change of direction is considered conclusive if a reversal equal in size to 25% of the last reaction occurs during what was expected to be an extension of the main trend. That 25% value becomes the trailing stoploss on any trade in the event the objective is not reached.

This discussion is not intended to be a complete representation of the Trident System, but a brief description of its essential ideas. The actual system has substantial refinements and subtleties in target selection for major and minor trends and corrective moves; it includes points to reverse positions based on the trailing stop.

In a later bulletin to Trident users, it was suggested that a modification to the system be implemented with respect to money management. Using a technique similar to the Martingale System, each loss is followed by an increase in the number of positions traded. The trader only has to continue to extend his positions and stay with the system until he wins. A comprehensive version of this classic gambling approach can be found in the section "Theory of Runs," in Chapter 17. The Trident concepts are all reasonable and generally accepted by experienced traders. They include advance and retracement, trade the trend, don't pick tops and bottoms, take the center out of each move, and use a trailing stop.

Rethinking Retracements

Interesting observations were made by Tom DeMark about identifying the price move that serves as the basis for measuring retracements. If the market is currently at a low, rather than judging the distance of this drop from the most recent swing high, he chooses to look for the highest point that has occurred since the last time the market traded at this low level. He then finds the most likely retracement points using the Fibonacci ratios .618, and 1.618, plus Fibonacci alternatives .382, .30, 1.382, 2.236, and 2.618 applied to the difference between the high and low, added to the current low price.

"Tom DeMark, "Retracing your steps," Futures (November 1995). Also see Chapter 2 of DeMark The New Science of Technical Analysis (John Wiley & Sons, 1994).

298

CHANNEL BREAKOUT

The classic channel is formed by drawing a straight line along the bottom of an upward trend (or the tops of a downtrend), then constructing a parallel line that touches the extreme high price of that same time interval, forming an envelop, or channel, around a price move. It is easy to do this with a chart and a ruler, but not as simple to transfer this concept to a computer program. Because the concept of a channel breakout is basic to charting, an automated version may prove useful for identifying key market turning points. The steps to creating a program are as follows:

1. Create a swing chart to identify key high and low points. A construction

of a swing chart was discussed in the first section of this chapter, "Finding the Swing High and Low Points." This method used a minimum swing value, MSV, to identify a swing high or low. For example, once a price had declined from its recent high by the MSV, that previous high becomes the last swing high. The swing highs and lows are therefore only found after the fact. When a larger MSV is used, the points identified as swing highs and lows become farther apart and are considered more important, or major swings. By creating two swing charts using a small and a large minimum swing value, we can show both major and minor market price swings (see Figure 127).

2. Find a straightline trend. Beginning with the last swing high or swing low, use the leastsquares linear regression to find the straight line through the center of prices that have occurred since that high or low:

Straightline value $Y = a \times \text{date} + b$

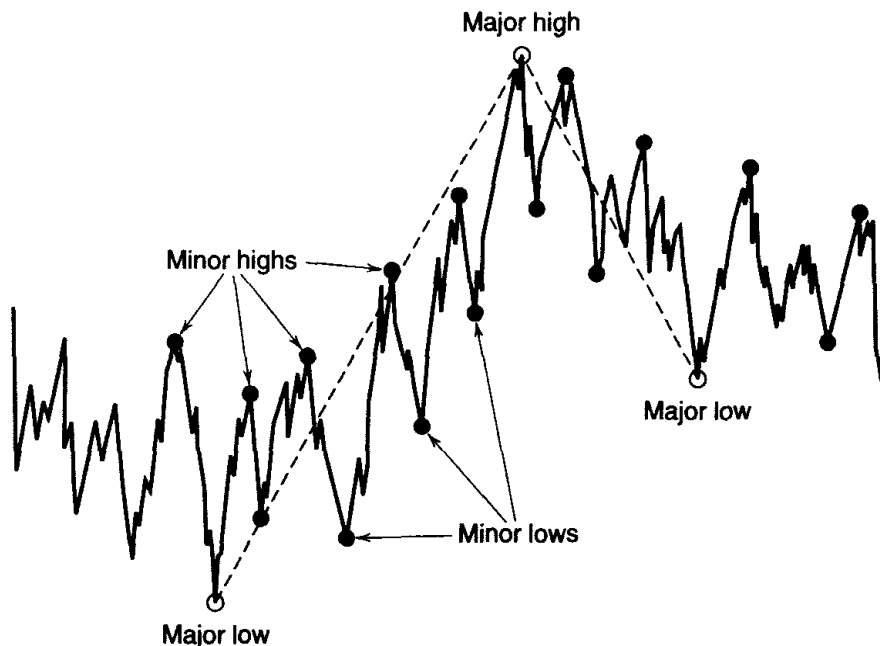
3. Draw channel bands. Beginning at the previous swing high or low, calculate the value Y of the linear regression line at all points up to the most recent date, and find the two prices that are the farthest above and below the regression line. These prices will define the upper and lower channel bands:

$$\text{Highest relative price } H_{\max} = H_t (aPt + b)$$

$$\text{Lowest relative price } L_{\max} = (aPt +$$

b) L_t

FIGURE 127 Major and minor swings.



where a and b are the linear regression slope and yintercept. The channel band is found by adding or subtracting $H \max$ and $L \max$ from the linear regression straightline formula:

Upper channel band = $aPt + b + H \max$

Lower channel band = $aPt + b - L \max$

4. Project the bands one period ahead. To know whether the next price has broken the channel, indicating a change of trend, we project the channel one period ahead using the slope value, a ,

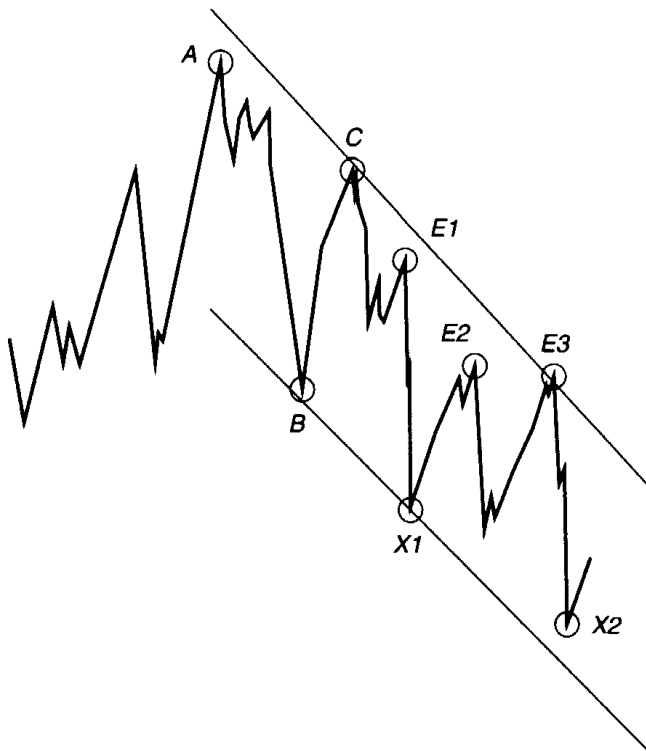
Projected upper channel band $t + 1$ $aPt + b + H \max + a$

Projected lower channel band $t + 1$ $aPt + b - L \max + a$

If the trend is up (the slope $a > 0$) and the next price is below the projected lower band, then the trend has turned from up to down. If the trend is down ($a < 0$) and the next price is greater than the projected upper band, then the trend has turned up. When the slope, a , is very near 0, we have a sideways channel and the same rules still apply.

Because a major channel is considered a strong chart formation, prices that approach the channel, but have not penetrated the band, would be candidates for trades. For example, if the trend is down and prices come within 15% of the upper band, we would want additional short positions (see Figure 128). We do not necessarily want to lift those existing shorts at the bottom of the channel, especially if the downtrend is severe; however, this

FIGURE 128 Entering near the top of a declining channel. Points A, 8, and C define the new channel. Trades can be entered at point E 1, exited at X1, then entered at E2 and E3 and exited at X2.



300

technique offers a clear and safe way to scale into a trade with more than one entry point. if the trend is sideways (the slope is near zero), then exiting shorts and reversing your position could work well.

A minor channel can also be used to signal buys and sells within a major channel. By finding swing points using a small minimum swing value, we can wait for a break of the minor channel to signal a trend direction within the major channel. This gives an added confirmation that prices are moving in your direction before entering.

MOVING CHANNELS

As computers have become common, channels are frequently constructed as moving bands around prices. Some of these, such as those using a standard deviation, can claim statistical significance (these are discussed in Chapter 5). A simple mathematical way of representing a channel might use the average of the high, low, and close to designate the center and a band based on the highs and lows. The midpoint of the price move M and height or range R of the move can be calculated

$$M_t = \frac{1}{3N} \sum_1^N (H_t + L_t + C_t)$$

$$R_t = \frac{1}{N} \sum_1^N (H_t - L_t)$$

Then, the upper and lower channel bands forecasted for the

$$U'_{t+1} = M_t + (M_t - M_{t-1}) + wR_t$$

$$L'_{t+1} = M_t + (M_t - M_{t-1}) - wR_t$$

The bands are created by extrapolating the average midpoint and adding or subtracting the average daily range R multiplied by a scaling factor w . A long position is taken when the new price $P_t > U'_{t+1}$; a short is taken when $P_t < L'_{t+1}$, if a channel profit objective is needed, it can be calculated at a point equal in distance to the channel width from the channel breakout as follows

$$\text{Long objective} \quad UO_{t+1} = U'_{t+1} + 2wR_t$$

$$\text{Short objective} \quad LO_{t+1} = L'_{t+1} - 2wR_t$$

Because the value wR_t represents one-half the band width, $2wR_t$, the objective is an equal band width above or below the breakout point on any day. The objective may remain fixed at the price level determined on the day of the breakout, or preferably, will change each day to remain one band width from the new channel value (Figure 129). This method relates closely to volatility measures and more examples can be found in Chapter 20.

An alternate way of defining a channel would be to forecast 1 day ahead using the slope of a regression analysis (linear for a straight channel, log for a curved one) and use the standard deviation of the price changes to define the band. The other rules would remain the same."

COMBINING TECHNIQUES

Richard D. Wyckoff, popular in the early 1930s, relied solely on charts to determine the motives behind price behavior. He combined the three most popular methods, bar chart

"For a further discussion of channels, see Donald Lambert, "Commodity Channel Index: Tool for Trading Cyclic Trends," *Tecimical Analysis of Stocks & Commodities* (October 1980), and John E Ehlers, "Trading Channels," *Tecimical Analysis of Stocks & Commodities* (April 1986).

ing, point charts (the predecessor of pointandfigure charts), and waves to

identify the direction, extent, and timing of price behavior, respectively. 16

To Wyckoff, the bar chart combined price and volume to show the direction of the price movement. In general terms, it shows the trading ranges in which supply and demand are balanced. The volume complemented this by giving the intensity of trading, which relates to the quality of the long or short position. Wyckoff used group charts, or indices, in the manner of Charles Dow, to select the stocks with the most potential, rather than looking only at individual stock price movement. This assures that the move is based on the broader nature of the business, rather than on company politics.

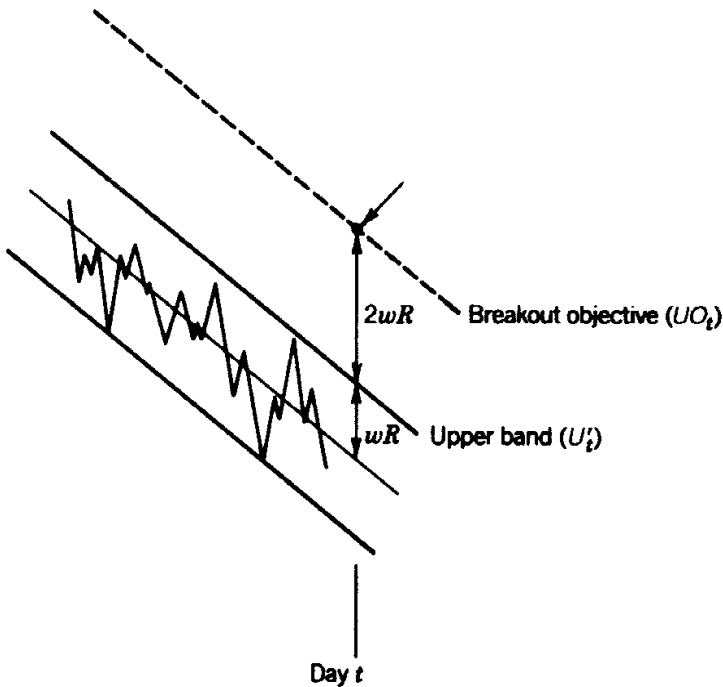
Pointandfigure charts are used to condense price action. If prices move from lower to higher levels due to events, the time it takes to reach the new level is unimportant. Pointandfigure charts record events, not time. As long as prices rise without a significant reversal, the chart uses only one column. When prices change direction, a new column is posted (see the pointandfigure section of Chapter 9 as well as the swing trading section of this chapter). Price objectives can be determined from formations in a pointandfigure chart usually related to the length of the sideways periods or horizontal formations. These objectives are very different and normally closer than objectives found using similar bar chart formations.

The wave chart, similar to Elliott's theories, represents the behavior of investors and the natural rhythm of the market. Wyckoff uses these waves to determine the points of buying and selling within the limitations defined by both the bar chart and pointandfigure charts. He considered it essential to use the wave charts as a leading indicator of price movement.

Wyckoff used many technical tools but not rigidly. He did not believe in unconfirmed fundamentals but insisted that the market action was all you neededthe market's primary forces of supply and demand could be found in charts. He did not use triangles, flags, and other formations, which he considered to be a type of Rorschach test, but limited his analysis to the most basic patternsthe horizontal or congestion areas. He used time

16 Jack K. Hutson, "Elements of Charting," *TecAmical Analysis of Stocks & Commodities* (March 1986)

FIGURE 129 Channel calculation.



302

based and eventbased charts to find the direction and forecast, then relied on human behavior (in the form of Elliott waves) for timing. His trading was successful and his principles have survived.

COMPLEX PATTERNS

Most charting systems involve a few simple rules, trying to model a price pattern that seems to have repeatedly resulted in a profitable move. The most popular systems are simply a breakout of a previous high or low, either a horizontal pattern or a trend channel. Over the years these approaches have proved to be steady performers. Another group of traders might argue that it is better to be more selective about each trade and increase the expectation of a larger profit, than to take many trades to win with the longterm probabilities.

DeMark's Sequential'

Tom DeMark has created a strategy, called a sequential, that finds a very overextended price move, one that is likely to change direction, and takes a countertrend position.' His selling objective is to identify the place where the last buyer has bought. His rules use counting and retracements rather than mathematical formulas or trendlines. To get a buy signal, the following steps are applied to daily data:

1. Setup. To begin, there must be a decline of at least nine or more consecutive closes that are lower than the corresponding closes 4 days earlier (close - close [41 < 0). In the case where today's close is equal or greater than the close 4 days before, the setup must begin

again.

2. Intersection. To assure that prices are declining in an orderly fashion, rather than plunging, the high of any day on or after the 8th day of the setup must be greater than the low of any day 3 or more days earlier. Note that there can be a delay before the intersection occurs provided that the pattern is not negated by the following rules.
3. Countdown. Once the setup and intersection have been satisfied, we count the number of days in which the close was lower than the close 2 days ago ($\text{close} < \text{close}[2]$). The days that satisfy this countdown requirement do not need to be continuous. When the countdown reaches 13 we get a buy signal unless one of the following conditions occurs:
 - a. There is a close that exceeds the highest intraday high that occurred during the setup stage.
 - b. A sell setup occurs (nine consecutive closes above the corresponding closes 4 days earlier).
 - c. Another buy setup occurs before the buy countdown is complete. In this case, the rules begin again at Step 2, the intersection. This condition is called recycling.

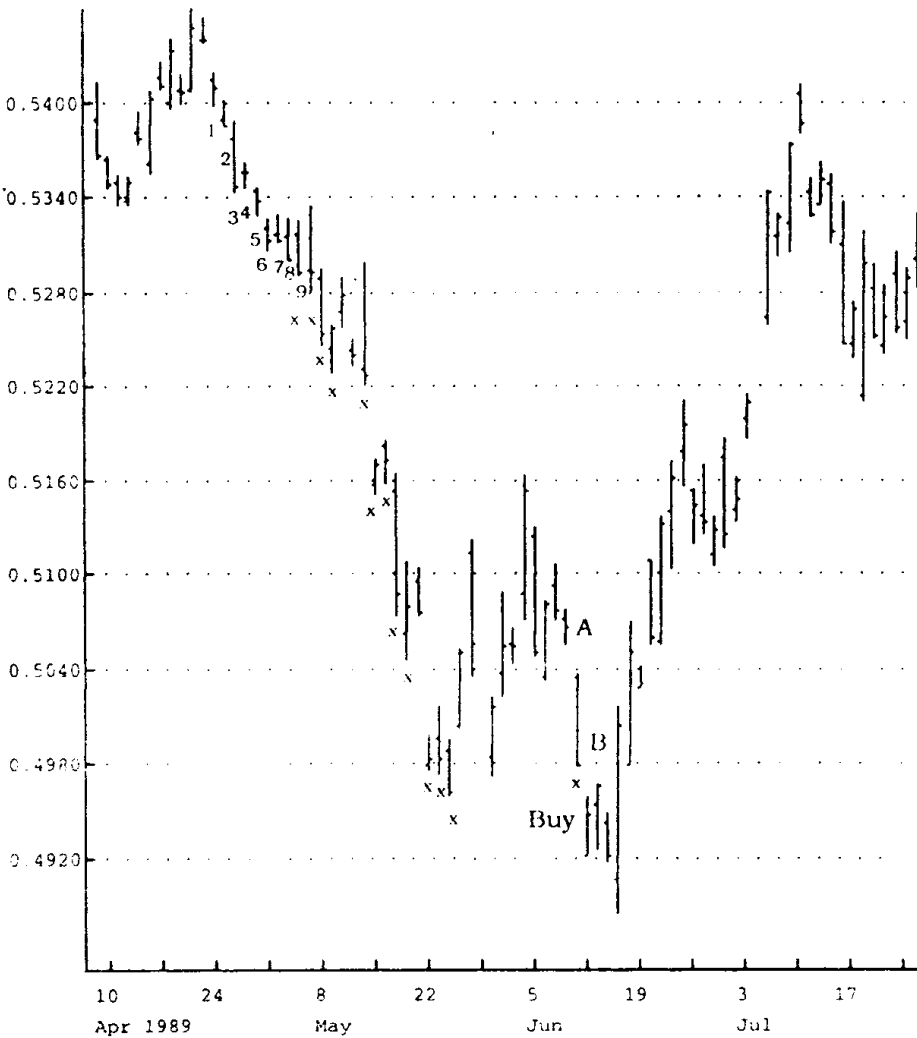
For the sequential pattern, the sell signal is the reverse of the buy. Traders should expect that the development of the entire formation will take no less than 21 days, but typically 24 to 39 days.

Entering the Sequential

Once the buy signal occurs, there are three choices for entering the market. The first is to enter on the close of the day on which the countdown is completed; however, this risks a new setup situation that will extend the conditions for an entry. The second requires a directional confirmation, the close greater than the close 4 days ago, but it avoids the possibility of recycling. The third is to enter a long when the close is greater than the high 2 days earlier, a compromise between the first two techniques.

" Thomas R. DeMark, *The New Science of Technical Analysis* (John Wiley & Sons, 1994).

Deutsche Mark



Source: Logical Information Machines, Inc. (LIM), Chicago, 11.

Exiting the Sequential

A number of exit conditions, consistent with the type of patterns, provide the trader with clear rules to liquidate the current trade. First, the current buy setup is complete, and the lowest price recorded does not exceed the furthest price recorded by the recent inactive setup (normally the previous sell setup). if, on the other hand, any price recorded in the current buy setup exceeds the furthest price of the previous sell setup, then the position is held until a reverse signal occurs.

Two stoplosses are also recommended. For a buy signal, the true range for the lowestrage day of the combined setup and countdown period

is subtracted from the low of that lowest day to create a stoploss. Alternately, the difference between the close and the low of the lowest day is subtracted from the low of the lowest day to form a closer stoploss.

Considering Complex Patterns

There seems to be an extreme contrast between the simple robustness of a breakout system and the very complex set of circumstances that produce a signal for DeMark's sequential. The philosophic consistency of the breakout system is demonstrated by applying

304

increasingly larger breakout criteria to the same market and observing that the reliability and profits per trade both increase, indicating that it becomes more selective, and those trades that occur have a better performance profile. in the case of a single pattern, such as an island reversal or DeMark's sequential, there is no way to measure this robustness. For the sequential, the time taken to identify a signal must also limit the number of signals that are possible. Each trader must decide whether this pattern selection produces a better set of trades, or if it is too demanding to survive the test of time.